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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/683,020 | 11/08/2001 | Kai Frank Goebel | RD-27825 | 6121 |

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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NISKAYUNA, NY 12309

| EXAMINER | |
|---|---|
| FERRIS III, FRED O | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2128 | |

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/683,020 | GOEBEL, KAI FRANK | |
| | Examiner | Art Unit | |
| | Fred Ferris | 2128 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-113* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-113* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/7/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

*1. Claims 1-113 have been presented for examination based on applicant's disclosure filed 8 November 2001. Claims 1-113 have been rejected by the examiner.*

### *Claim Interpretation*

*2. Applicants are disclosing a system and method for assessing the performance of an algorithm (model) under development using design of experiments (DOE) techniques for establishing an acceptable number of experiments in analyzing improvements to an algorithm (model) during simulation. The examiner notes that applicants appear to have broadly claimed the use of DOE in improving the performance of a process model (algorithm) by performing (n) number of experiments based well-known DOE concepts when simulating the behavior of a process model (algorithm). (see: Klemola 2.13.16, page 65, for example) Further, the claimed limitations relating to features such as number of experiments, Monte Carlo simulation, and factorial experiments, are features generally inherently available in the numerous commercially available DOE software packages such as STATISTICA, Design-Expert, SimProcess, CARD, and available as add-ons to the popular MatLab, ANSYS, and ChemDraw programs. The claimed confusion matrix, for example, appears to merely be a randomization matrix and hence would be inherent in the Taguchi DOE methods of the prior art as noted below under 35 USC 102 rejections. Accordingly, the examiner has as interpreted the elements of independent claims 1, 14, 26, and 38 relating to the claimed DOE component, experiment performance component, and simulation component, as analyzing any*

*algorithm (i.e. improving any process model), to be necessarily inherent elements of any of these commercially available DOE software packages. Specifically, the examiner has interpreted the claimed limitations to merely be drawn to assessing (evaluating by any means) the performance of an algorithm (i.e. any process model) by establishing (i.e. performing) any number of experiments for the process model (algorithm), and then simulating the behavior of the process model based the selected number of experiments. While such features are generally standard features of the commercially available DOE software packages noted above (see: Angel Section 2, table 1, or Porter "Experimentation", or Klemola 2.13.16, page 65, for example), applicants are invited to explain any specific novel aspects of the claimed limitations over the prior art.*

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

***3. Claims 40-76 are rejected under 35 U.S.C. 101 because the claimed invention is drawn to non-statutory subject matter.***

*The Examiner submits that method claims 40-76, as written, are merely drawn to a mental process for assessing the performance of an algorithm, since the language of the claims can be interpreted as meaning the method is carried out by a mental process augmented (calculated) using pencil and paper. (i.e. not a computer process)*

***MPEP 2111 [R-1]*** *recites the following:*

*"2111 [R-1] Claim Interpretation; Broadest Reasonable Interpretation*

***CLAIMS MUST BE GIVEN THEIR BROADEST REASONABLE INTERPRETATION***

*During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." In re Hyatt, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000).< Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969) (Claim 9 was directed to a process of analyzing data generated by mass spectrographic analysis of a gas. The process comprised selecting the data to be analyzed by subjecting the data to a mathematical manipulation. The examiner made rejections under* ***35 U.S.C. 101*** *and 102. In the 35 U.S.C. 102 rejection, the examiner explained that* ***the claim was anticipated by a mental process augmented by pencil and paper markings****.* ***The court agreed that the claim was not limited to using a machine to carry out the process since the claim did not explicitly set forth the machine****. The court explained that "reading a claim in light of the specification, to thereby interpret limitations explicitly recited in the claim, is a quite different thing from reading limitations of the specification into a claim,' to thereby narrow the scope of the claim by implicitly adding disclosed limitations which have no express basis in the claim." The court found that applicant was advocating the latter, i.e., the impermissible importation of subject matter from the specification into the claim.). See also In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997) (The court held that the PTO is not required, in the course of prosecution, to interpret claims in applications in the same manner as a court would interpret claims in an infringement suit. Rather, the "PTO applies to verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in applicant's specification.")"*

The Examiner further submits that, in view of the language of the claims, Applicant's have merely claimed a manipulation of abstract ideas by a mental process. Section 2106 [R-2] (Patentable Subject Matter — Computer-Related Inventions) of the MPEP recites the following:

*"In practical terms, claims define nonstatutory processes if they:*
*– consist solely of mathematical operations without some claimed practical application (i.e., executing a "mathematical algorithm"); or*
*–* ***simply manipulate abstract ideas****, e.g., a bid (Schrader, 22 F.3d at 293-94, 30 USPQ2d at 1458-59) or a bubble hierarchy (Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759),* ***without some claimed practical application****."*

*In this case, claims 40-76 are simply drawn to the manipulation of abstract ideas by the mental process of assessing the performance of an algorithm.*

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***4. Claims 1-113 are rejected under 35 U.S.C. 102(a) as being anticipated by "Design-Ease Software Version 6 User's Guide" Stat-Ease Inc. Copyright 2000.***

*Regarding independent claims 1, 14, 26, and 33: Design-Ease Version 6 discloses a system and method for assessing the performance of a developmental algorithm (i.e. a process model) using DOE methods in establishing an acceptable number of experiments for analyzing an algorithm (model). (3-1, 4-2, 4-8, 5-4, and sections 8 and 9) Design-Ease Version 6 further discloses running established number of experiments on an algorithm (model) and simulating the behavior of the algorithm (model) using experiment performance results (page 6-1, Section 6, 8-10, page 10-9). As such, the examiner asserts that the claimed DOE component, experiment performance component, and simulation component, are necessarily inherent elements of Design-Ease Version 6. That is, these "components" would obviously be inherent in*

*order to perform the DOE elements disclosed on pages 3-1, 4-2, 4-8, 5-4, and sections 8 and 9, the experiment analysis (performance) of pages 3-7, 4-3, 4-9, 4-18, 5-8, 8-5, 9-1, and simulation on pages 10-9-12, and sections 8 and 9, of Design-Ease Version 6.*

*Per dependent claims 2-8, 15-21, 27-29, 34-38: Design-Ease Version 6 includes features relating to selecting number of experiments (page 6-1, sections 3-5, 8-10), factorial and screening experiments (Sections 3-6, 8-10), performance (selecting runs) (page 6-1, sections 3-5, 8-10), and adjustment of logic and parameters (page 6-1, sections 3-5, 8-10).*

*Per dependent claims 9-13, 22-25, and 30-32: Design-Ease Version 6 also includes features relating to the use of random (confusion) matrixes (3-4, 4-9), and adjusting the logic or parameters based on simulation runs (section 10). Monte Carlo simulation techniques are well known elements of Taguchi DOE methods (See; ANSYS White Paper, page 1, "Mechanical Design Synthesis", Ramberg et al page 170, para: 2, Section 3.0, or page 429, section 2, para: 2, for example) and hence would obviously be inherent to the DOE and Taguchi models disclosed by Design-Ease Version 6.*

*Per independent claims 38, 40, 52, 63, 70, and 75: As previously cited above, Design-Ease Version 6 discloses a system and method for assessing the performance of a developmental algorithm (i.e. a process model) using DOE methods in establishing an acceptable number of experiments for analyzing an algorithm (model). (3-1, 4-2, 4-8, 5-4, and sections 8 and 9) Design-Ease Version 6 further discloses running established number of experiments on an algorithm (model) and simulating the behavior of the algorithm (model) using experiment performance results (page 6-1, Section 6, 8-10,*

*page 10-9). That is, Design-Ease Version 6 teaches the use of DOE elements in establishing experiments, pages 3-1, 4-2, 4-8, 5-4, and sections 8 and 9, experiment analysis (performance) of pages 3-7, 4-3, 4-9, 4-18, 5-8, 8-5, 9-1, and model simulation, pages 10-9-12, and sections 8 and 9. As also previously cited above, Monte Carlo simulation techniques are well known elements of Taguchi DOE methods (See; ANSYS White Paper, page 1, "Mechanical Design Synthesis", Ramberg et al page 170, para: 2, Section 3.0, or page 429, section 2, para: 2, for example) and hence would obviously be inherent to the DOE and Taguchi models disclosed by Design-Ease Version 6.*

*Per dependent claims 39, 41-51, 53-62, 64-69 and 71-74: Design-Ease Version 6 includes features relating to selecting number of experiments (page 6-1, sections 3-5, 8-10), factorial and screening experiments (Sections 3-6, 8-10), performance (selecting runs) (page 6-1, sections 3-5, 8-10), and adjustment of logic and parameters (page 6-1, sections 3-5, 8-10) Design-Ease Version 6 also includes features relating to the use of random (confusion) matrixes (3-4, 4-9), and adjusting the logic or parameters based on simulation runs (section 10).*

*Per claims 77-113: These claims merely recite the computer-readable medium for the same limitations addressed in claims 1-76 and are therefore rejected using the same reasoning as previously cited above.*

***5. Claims 1-113 are also rejected under 35 U.S.C. 102(b) as being anticipated by "Conducting Experiments With Experiment Manager", M. Angel, pp. 535-541, Proceedings 1996 Winter Simulation Conference ACM 1996.***

*Regarding independent claims 1, 14, 26, and 33: Angel discloses the SIMPROCESS simulation and modeling tool for assessing the performance of a developmental algorithm (i.e. a process model) using DOE methods in establishing an acceptable number of experiments for analyzing an algorithm (model). (Section 2.0, Table 1) Angel further discloses SIMPROCESS running an established number of experiments on an algorithm (model), and simulating the behavior of the algorithm (model) using experiment performance results (Sections 3, 4, Figs 2-4). As such, the examiner asserts that the claimed DOE component, experiment performance component, and simulation component, are necessarily inherent elements of the SIMPROCESS modeling tool disclosed by Angel. That is, these "components" would obviously be inherent in order to perform the DOE elements, the experiment analysis (performance) and model simulation disclosed by Angel in Sections 2-4, Figures 1-4, and in Table 1.*

*Per dependent claims 2-8, 15-21, 27-29, 34-38: SIMPROCESS includes features relating to selecting number of experiments, factorial and screening experiments, performance (selecting runs), and adjustment of logic and parameters (Section 2, 3, Table 1, Fig. 3)*

*Per dependent claims 9-13, 22-25, and 30-32: SIMPROCESS also includes features relating to the use of random (confusion) matrixes, and adjusting the logic or parameters based on simulation runs (Section 4, Table 1). Monte Carlo simulation techniques are well known elements of Taguchi DOE methods (See; ANSYS White Paper, page 1, "Mechanical Design Synthesis", Ramberg et al page 170, para: 2,*

*Section 3.0, or page 429, section 2, para: 2, for example) and hence would obviously be inherent to the DOE models of SIMPROCESS as disclosed by Angel.*

*Per independent claims 38, 40, 52, 63, 70, and 75: As previously cited above, Angel discloses the SIMPROCESS simulation and modeling tool for assessing the performance of a developmental algorithm (i.e. a process model) using DOE methods in establishing an acceptable number of experiments for analyzing an algorithm (model). (Section 2.0, Table 1) Angel further discloses SIMPROCESS running an established number of experiments on an algorithm (model), and simulating the behavior of the algorithm (model) using experiment performance results (Sections 3, 4, Figs 2-4). That is, Angel teaches the use of SIMPROCESS DOE elements in establishing experiments, experiment analysis (performance), and model simulation in sections 2-4, Figures 1-4 and in Table 1. As also previously cited above, Monte Carlo simulation techniques are well known elements of Taguchi DOE methods (See; ANSYS White Paper, page 1, "Mechanical Design Synthesis", Ramberg et al page 170, para: 2, Section 3.0, or page 429, section 2, para: 2, for example) and hence would obviously be inherent to the SIMPROCESS DOE models disclosed by Angel.*

*Per dependent claims 39, 41-51, 53-62, 64-69 and 71-74: As also previously cited above, SIMPROCESS includes features relating to selecting number of experiments, factorial and screening experiments, performance (selecting runs), and adjustment of logic and parameters (Section 2, 3, Table 1, Fig. 3) SIMPROCESS also includes features relating to the use of random (confusion) matrixes, and adjusting the logic or parameters based on simulation runs (Section 4, Table 1). Monte Carlo*

*simulation techniques are well known elements of Taguchi DOE methods (See; ANSYS White Paper, page 1, "Mechanical Design Synthesis", Ramberg et al page 170, para: 2, Section 3.0, or page 429, section 2, para: 2, for example) and hence would obviously be inherent to the DOE models of SIMPROCESS as disclosed by Angel.*

*Per claims 77-113: These claims merely recite the computer-readable medium for the same limitations addressed in claims 1-76 and are therefore rejected using the same reasoning as previously cited above.*

***Conclusion***

*6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.*

*"Designing Simulation Experiments: Taguci Methods and Response Surface Metamodels", Ramsberg et al, Proceedings 1991 Winter Simulation Conference, pp 167-176, ACM 1991 teaches DOE and process model optimization.*

*"Regression Metamodels and Design of Experiments", van Groenendall et al, Proceedings 1996 Winter Simulation Conference, pp 1433-1439, ACM 1996 teaches DOE and process model optimization.*

*Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 571-272-3778 and whose normal working hours are 8:30am to 5:00pm Monday to Friday. Any inquiry of a general nature relating to the status of this application should be directed to the*

*group receptionist whose telephone number is 571-272-3700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean Homere can be reached at 571-272-3780. The Official Fax Number is:* (703) 872-9306

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